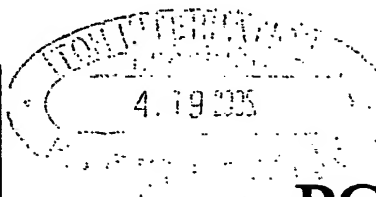


# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:  
ITO, Tadahiko

32nd Floor, Yebisu Garden Place  
Tower, 20-3, Ebisu  
4-chome, Shibuya -ku, Tokyo  
1506032 Japan



PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY  
(PCT Rule 43 bis.1)

Date of mailing (day/month/year)	18.04.2006
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Applicant's or agent's file reference  
R05244PCT

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/JP2005/023699

International filing date (day/month/year)  
19.12.2005

Priority date (day/month/year)  
24.12.2004

International Patent Classification (IPC) or both national classification and IPC  
Int.Cl. H01L27/088 (2006.01), H01L27/115 (2006.01), H01L29/788 (2006.01)

Applicant  
RICOH COMPANY, LTD.

**1. This opinion contains indications relating to the following items:**

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

**2. FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

**3. For further details, see notes to Form PCT/ISA/220.**

Date of completion of this opinion	28.03.2006
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Name and mailing address of the ISA/JP

**Japan Patent Office**

3-4-3, Kasumigaseki, Chiyoda-ku, Tokyo 100-8915, Japan

Authorized officer

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WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2005/023699

Box No. I

Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
  - ☒ the international application in the language in which it was filed
  - ☐ a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material
    - ☐ on paper
    - ☐ in electronic form
  - c. time of filing/furnishing
    - ☐ contained in the international application as filed
    - ☐ filed together with the international application in electronic form
    - ☐ furnished subsequently to this Authority for the purposes of search
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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International application No.

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Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has, within the applicable time limit:
- ☒ paid additional fees
  - ☐ paid additional fees under protest and, where applicable, the protest fee
  - ☐ paid additional fees under protest but the applicable protest fee was not paid
  - ☐ not paid additional fees

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is

- ☐ complied with
- ☒ not complied with for the following reasons:

D1: US 2003/0203575 A1 (Hung et al.), 2003.10.30

The separate inventions are not so linked as to form a single general inventive concept for the following reasons:

The same or corresponding matters (A) between the inventions of claims Nos. 1-22 are "a nonvolatile memory cell that includes a memory transistor and a selection transistor, the memory transistor being realized by a MOS transistor including a memory gate oxide film that is arranged on a semiconductor substrate and a floating gate made of polysilicon that is arranged on the memory gate oxide film which floating gate in an electrically floating state, and the selection transistor being realized by a MOS transistor serially connected to the memory transistor and including a selection gate oxide film that is arranged on the semiconductor substrate and a selection gate made of polysilicon that is arranged on the selection gate oxide film; and a peripheral circuit transistor realized by a MOS transistor including a peripheral circuit gate oxide film that is arranged on the semiconductor substrate, and a peripheral circuit gate made of polysilicon that is arranged on the peripheral circuit gate oxide film".

However, after taking the prior art into consideration, it became apparent that the matters (A) were mentioned in document D1, column [0037], figs.3-9. Therefore, the matters (A) makes no contribution over the prior art. Thus there is no same or corresponding "special technical features" which is the expression in the PCT Rule 13.2. Therefore, there is no technical relationship between the inventions of claims Nos. [1-22].

4. Consequently, this opinion has been established in respect of the following parts of the international application:

- ☒ all parts
- ☐ the parts relating to claims Nos. \_\_\_\_\_

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

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**Box No. V** Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability, citations and explanations supporting such statement

**1. Statement**

Novelty (N)	Claims	2, 5-22	YES
	Claims	1, 3, 4	NO
Inventive step (IS)	Claims		YES
	Claims	1-22	NO
Industrial applicability (IA)	Claims	1-22	YES
	Claims		NO

**2. Citations and explanations:**

D1:US 2003/0203575 A1 (Hung et al.) 2003.10.30,  
D2:US 2003/0235082 A1 (Hsu et al.) 2003.12.25,  
D3:JP 2003-347435 A (RICOH KK) 2003.12.05,  
D4:US 5925907 A (Hazama) 1999.07.20,

[ Claims 1, 3, 4]

The subject matter of claims 1, 3, 4 does not appear to be novel with respect to D1. The matters of "the memory gate oxide film is arranged to be thinner than the peripheral circuit gate oxide film" appears to be known from D1 (see column [ 0037] , figs.3-9).

[ Claims 12-18]

The subject matter of claims 12-18 does not appear to involve an inventive step in view of D1 and D4. D4 discloses that an impurity concentration within the polysilicon of the floating gate is arranged to be lower than an impurity concentration within the polysilicon of the peripheral circuit gate oxide film(see column 6, line 59-column 7, line 18, figs.1A-2B).

[ Claims 2, 19]

The subject matter of claims 2, 19 does not appear to involve an inventive step in view of D1, D4 and D2. D2 discloses that the memory transistor and the selection transistor are PMOS transistors (see column figs.3A,3B,4).

[ Claims 5-11, 20-22]

The subject matter of claims 5-11, 20-22 does not appear to involve an inventive step in view of D1, D4 and D3. D3 discloses that "the floating gate and the lower electrode are created from a same polysilicon layer, and the capacitor insulating film is arranged on an upper surface and a side surface of the floating gate", "a divider resistor circuit" with "a plurality of fuse MOS transistors", and etc.(see figs.5,6).